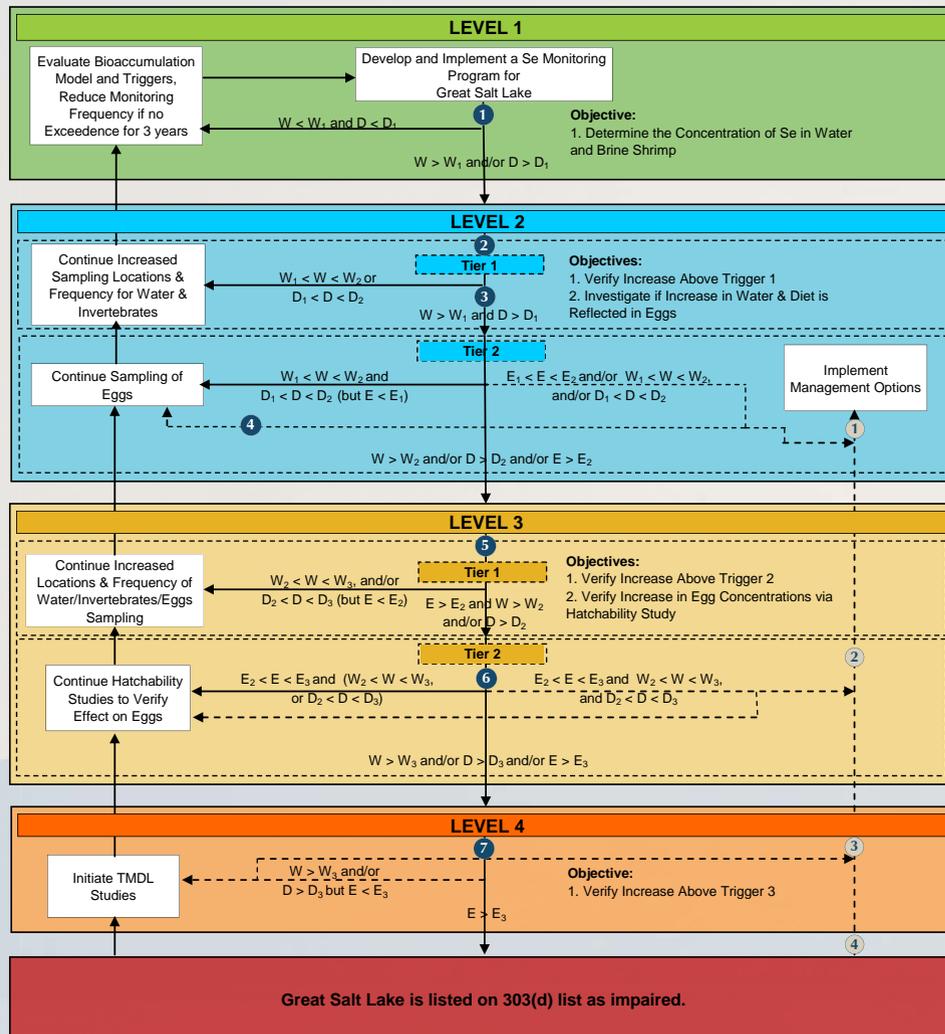


Development of a Selenium Standard for the Open Waters of Great Salt Lake

Great Salt Lake Water Quality Studies

How can we proactively prevent selenium in Great Salt Lake from reaching the water quality standard?

Concept for Tiered Assessment Framework



Definitions

W_1 : Trigger 1 for water concentration W_2 : Trigger 2 for water concentration W_3 : Trigger 3 for water concentration
 D_1 : Trigger 1 for diet concentration D_2 : Trigger 2 for diet concentration D_3 : Trigger 3 for diet concentration
 E_1 : Trigger 1 for egg concentration E_2 : Trigger 2 for egg concentration E_3 : Trigger 3 for egg concentration
 Trigger 3 represents the site-specific numeric water quality standard; this may be a water or tissue-based concentration.

Objectives for Tiered Assessment Framework

Tiered approach was developed to address the following objectives:

- Minimize the risk of selenium in Great Salt Lake exceeding water quality standard
- Monitor Great Salt Lake to assess trends in selenium concentrations and determine whether they are approaching or exceeding the water quality standard in eggs, using water and diet (measured in brine shrimp and estimated in brine flies by a "translation factor") as indicators of whether the standard is likely to be exceeded in eggs
- Address current uncertainty in modeled bioaccumulation relationships by validating expected bioaccumulation with new data for water and diet concentrations and, if appropriate, egg selenium and hatchability
- Evaluate trigger selenium concentrations that initiate various monitoring, assessment and management actions identified in the assessment framework
- Evaluate the lake with respect to the numeric water quality standard for selenium
- Initiate management actions to mitigate further increases in selenium concentration if an upward trend is observed

Sampling Program for Consideration

- 1 Sample water and brine shrimp at four locations semi-annually.
- 2 Increase sampling of water and brine shrimp to eight locations on quarterly basis.
- 3 Add sampling of eggs at two locations for two bird species on annual basis.
- 4 Increase sampling of eggs to three locations for two bird species on annual basis.
- 5 Increase sampling of water and brine shrimp to eight locations on monthly basis, eggs at three locations for two bird species on annual basis.
- 6 Add completion of hatchability study for one bird species on annual basis.
- 7 Expand hatchability study to two bird species on annual basis.

Management Actions for Consideration

- 1 Require Antidegradation Review Level II for all new discharges.
- 2 Implement caps on Se loads from existing point discharges.
- 3 Initiate preliminary studies for load reductions
- 4 Implement load reduction and declare impairment.